

Kindly amend claims 2-5 as follows:

2. (Amended) A plasma processing method for generating plasma within a vacuum chamber and processing a substrate placed on a substrate electrode within the vacuum chamber, the method comprising:

generating the plasma by radiating electromagnetic waves into the vacuum chamber via a dielectric window provided on an upper inner surface of the vacuum chamber opposing the substrate by supplying a high-frequency power having a frequency of 50 MHz to 3 GHz to an antenna while an interior of the vacuum chamber is maintained at a specified pressure by introducing gas into the vacuum chamber and, simultaneously therewith, evacuating the interior of the vacuum chamber; and

processing the substrate by using the generated plasma while plasma distribution of the plasma on the substrate is controlled by an annular, groove-shaped plasma trap arranged in the upper inner surface of the vacuum chamber such that an outer diameter of the plasma trap is smaller than an inner side surface diameter of the vacuum chamber and such that the upper inner surface of the vacuum chamber includes a metallic surface portion between the outer periphery of the plasma trap and the inner side surface of the vacuum chamber so that the metallic surface portion opposes the substrate.

3. (Amended) A plasma processing method according to Claim 2, wherein the substrate is processed while a portion of the upper inner surface of the vacuum chamber opposing the substrate and surrounded by the plasma trap has an area 0.5 to 2.5 times that of the substrate.

4. (Amended) A plasma processing method according to Claim 2, wherein the substrate is processed while the plasma trap has a groove width of 3 mm to 50 mm.

5. (Amended) A plasma processing method according to Claim 2, wherein the substrate is processed while the plasma has a groove depth of not less than 5 mm.

Kindly cancel claims 6-9 presently pending in the application without prejudice.

Kindly amend claim 10-12 as follows.

10. (Amended) A plasma processing method according to Claim 2, wherein the plasma is generated while the plasma trap is arranged in the dielectric window such that the outer diameter of the plasma trap is less than the outer diameter of the dielectric window.

11. (Amended) A plasma processing method according to Claim 2, wherein the plasma is generated while the plasma trap is arranged in the upper inner surface of the vacuum chamber such that an inner diameter of the plasma trap is larger than an outer diameter of the dielectric window.

12. (Amended) A plasma processing method according to Claim 2, wherein the upper inner surface of the vacuum chamber includes a dielectric window surface portion formed by the dielectric window and includes a vacuum chamber upper surface wall portion formed by an upper vacuum chamber wall, the plasma is generated while the plasma trap is arranged in the upper inner surface of the vacuum chamber between the vacuum chamber upper surface wall portion and the dielectric window surface portion.

Kindly cancel claims 13 and 14 presently pending in the application without prejudice.

Kindly amend claims 15-17 as shown below.

15. (Amended) A plasma processing apparatus comprising:
a vacuum chamber having an upper inner surface opposing a substrate to be placed in the vacuum chamber and an inner side surface;
a gas supply unit for supplying gas into the vacuum chamber;
an evacuating device for evacuating an interior of the vacuum chamber;
a substrate electrode for placing thereon the substrate within the vacuum chamber;

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a dielectric window provided opposite to the substrate electrode and forming a portion of the upper inner surface of the vacuum chamber;

an antenna for radiating electromagnetic waves into the vacuum chamber via the dielectric window;

a high-frequency power supply capable of supplying a high-frequency power having a frequency of 50 MHz to 3 GHz to the antenna; and

an annular, groove-shaped plasma trap arranged in the upper inner surface of the vacuum chamber such that an outer diameter of the plasma trap is smaller than the inner side surface diameter of the vacuum chamber and such that the upper inner surface of the vacuum chamber includes a metallic surface portion between the outer periphery of the plasma trap and the inner side surface of the vacuum chamber so that the metallic surface portion opposes the substrate.

16. (Amended) A plasma processing apparatus according to Claim 15, wherein the upper inner surface of the vacuum chamber includes a portion surrounded by the plasma trap having an area 0.5 to 2.5 times that of the substrate.

17. (Amended) A plasma processing apparatus according to Claim 15, wherein the plasma trap has a groove width of 3 mm to 50 mm.

Kindly cancel claims 18-23 presently pending in the application without prejudice.

Kindly amend claims 24-26 as shown below.

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24. (Amended) A plasma processing apparatus according to Claim 15, wherein the plasma trap is arranged in the dielectric window such that the outer diameter of the plasma trap is less than the outer diameter of the dielectric window.

25. (Amended) A plasma processing apparatus according to Claim 15, wherein the plasma trap is arranged in the upper inner surface of the vacuum chamber such that an inner diameter of the plasma trap is larger than an outer diameter of the dielectric window.

26. (Amended) A plasma processing apparatus according to Claim 15, wherein the upper inner surface of the vacuum chamber includes a dielectric window surface portion formed by the dielectric window and includes a vacuum chamber upper surface wall portion formed by an upper vacuum chamber wall, the plasma trap is arranged in the upper inner surface of the vacuum chamber between the vacuum chamber upper surface wall portion and the dielectric window surface portion.

Kindly cancel claims 27-54 presently pending in the application without prejudice.